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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,053	06/15/2005	Yongzhang Yu	0630-2363PUS1	7389

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EXAMINER	
TRAN, WILLIAM VINH	

ART UNIT	PAPER NUMBER
4156	

NOTIFICATION DATE	DELIVERY MODE
04/02/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/539,053	YU ET AL.	
	Examiner	Art Unit	
	WILLIAM V. TRAN	4156	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06 / 15/ 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because the legal "comprising" phraseology term is used. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1,12,16, 26, and 27; 2, 13, and 17; 3, 14-15 and 18-20; 7-8 and 24; 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Voss et al. 5,555,956.

5. Regards claims 1,12,16,26, and 27, Voss disclosed (Column 3 Line 26-31; Column 1 Line 54-58 and Figure 2) a refrigeration system comprising: **1)** a **compression unit (20)** that consist of **two sub compressions**, of which the **2) first**

compression for sucking the fluid discharged from the heat absorption unit and **3) second compression** for re-compression the fluid discharged from the intermediate cooling; **4)** an **intermediate cooling** which Voss disclosed a compressor (20) utilizes a low pressure refrigerant having a boiling point at standard atmospheric pressure in combination with lubricant in the refrigerant to lubricate and cool the compressor as the refrigerant mixture is circulated through a refrigerant pathway / **cooling flow** in the compressor.; **5)** an **evaporator (26)** for absorbing heat from refrigerant; **6) expansion** of the refrigerant takes place while the fluid flow through inside of the **compression unit (20)** as shown in Figure 3; **7)** a **condenser (22)** for radiating heat from refrigerant.

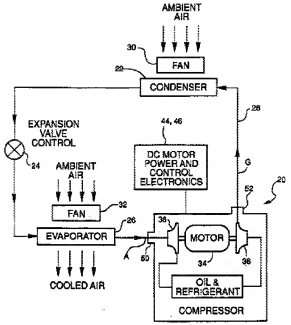

AMBIENT AIR
30
FAN
22
CONDENSER
28
EXPANSION VALVE CONTROL
44, 46
24
AMBIENT AIR
DC MOTOR POWER AND CONTROL ELECTRONICS
G
52
20
FAN
32
36
MOTOR
EVAPORATOR
26
50
34
38
COOLED AIR
OIL & REFRIGERANT
COMPRESSOR

FIG - 2

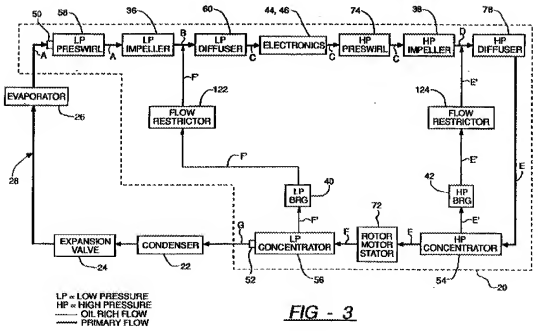
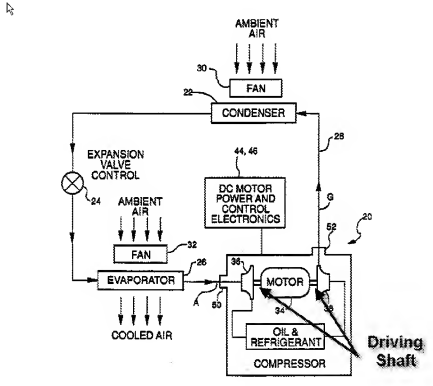

50
56
36
60
44, 46
74
38
78
LP PRESWIRL
LP IMPELLER
LP DIFFUSER
ELECTRONICS
HP PRESWIRL
HP IMPELLER
HP DIFFUSER
A
B
C
D
F
E
E'
EVAPORATOR
26
122
124
FLOW RESTRICTOR
FLOW RESTRICTOR
28
40
42
LP BRG
HP BRG
72
EXPANSION VALVE
24
CONDENSER
22
LP CONCENTRATOR
ROTOR MOTOR STATOR
HP CONCENTRATOR
52
56
54
20
LP = LOW PRESSURE
HP = HIGH PRESSURE
OIL RICH FLOW
PRIMARY FLOW

FIG - 3

6. Regards claim 2,13, and 17 Voss disclosed (Column 2 Line24-26 and see reproduced Figure 2) a two-stage centrifugal compressor having the motor (34) connected to a driving shaft as a driving unit, mounted between the two stages.

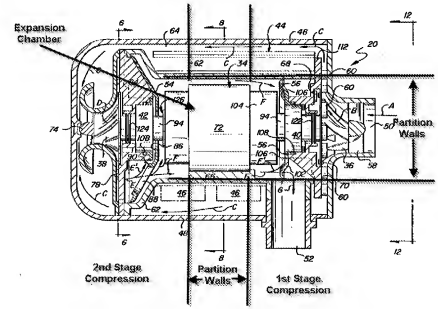


Reproduced Figure 2

7. Regards Claims 3, 14-15 and 18- 20, Voss disclosed (reproduced Figure 2 and Figure 3) wherein the compression unit (20), communicated with the expansion unit (shown in Figure 3 above), connected to the driving shaft so that the fluid can be

expanded through first and second compression in a result of cooling the motor during the intermediate cooling.

8. Regards Claims 7-8 and 24, Voss disclosed a plurality of wall installed among the first compression, the second compression, and the expansion unit; plurality of external wall installed at the front end portion of the first compression and a rear portion of the expansion unit for forming the chamber and the expansion chamber as shown in reproduced Figure 1.



Reproduced Figure 1

9. Regards claims 10 and 11, Voss discloses (Column 4 Line 46-52) the system wherein heat dissipated by the condenser and heat absorbed is by the evaporator.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

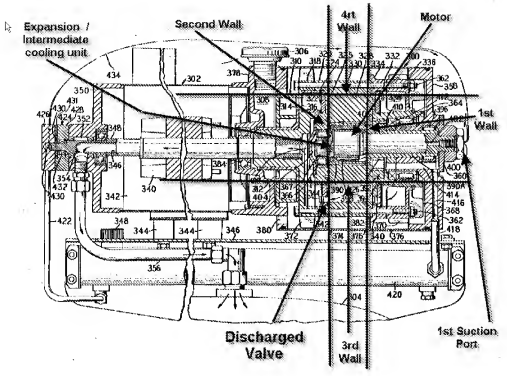
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 4-6 and 21-23; 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Voss et al. 5,555,956 in view of Hoffmann 5,046,932**.

13. Regards claims 4-6 and 21-23, Voss discloses all elements, as previous modified, except wherein the compressions unit of which an expansion unit includes an inner and outer gear. Hoffmann teaches (Figure 2 and Column 12 Line 8-32) a compression units of which communicates in an expansion unit consist of a gear operation in the rotary portion of the two-stage compression that consist of an integral pinion gear (50), engaged to the driving shaft (42), having teeth which mesh with an

outer gear (52). One of ordinary skill in the art at the time of the invention would have been motivated to modify the element in Voss with Hoffmann to have a pinion gear set incorporated in the compression units is to increase the performance operation of the compressor.

14. Regards claim 7, Hoffmann teaches in Figure 11 of a 1) first partition wall installed at one side of the first compression unit and a first suction port for sucking fluid to a compression chamber, and a discharge port, 2) a second partition wall installed between the first compression unit and the second compression unit and having a suction port for sucking the fluid from the intermediate cooling to a compression, 3) a third wall installed between the second compression unit the expansion unit and having a second discharge port, and 4) fourth partition wall installed at the opposite side of the second partition wall unit on the basis of the expansion unit and having a third discharge port for discharging the fluid from the expansion unit as shown in reproduced Fig. 11. One of ordinary skill in the art at the time of the invention would have been motivated to modify Voss with Hoffmann to have partition wall along the expansion unit to prevent the heat convection throughout the compressor unit.



Reproduced Figure 11

15. Claims 9 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Voss et al. 5,555,956, Hoffmann 5,046,932 in further view of Dreiman et al 10/183,727**.

16. Regards claims 9 and 25, Voss discloses all elements, as previous modified, except the system wherein the fluid is CO2. Dreiman teaches (Column 2 Line 7-9) that the two stage compressor which uses carbon dioxide as the working fluid. One of

ordinary skill in the art at the time of the invention would have been motivated to modify the element in Voss with Dreiman to use Carbon Dioxide as a working refrigerant fluid in a two-stage compressor so that it can withstand a high temp pressure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM V. TRAN whose telephone number is (571)270-3770. The examiner can normally be reached on Monday-Friday 8:30AM-5:00PM(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Isabella can be reached on (571)272-4749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dmitry Suhol/
Primary Examiner, Art Unit 3725

William V. Tran
Patent Examiner

WT